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JUN 20 2007

Remarks

Claims 51-64, 71-84, 91-94 and 99 remain in the application. Claims 51, 91 and 99 have been amended to state that the mat is useful as the scored and folded vertical webs spanning between an exposed mat and a backer mat in a compressible ceiling tile as disclosed in published U. S. Patent Application No. 20020020142 filed April 23, 2001, including the ability to, after being scored, folded, and compressed, to spring back to the original shape and orientation, basis found in the last paragraph of the Background on page 1 and in Example 1 of the specification. Claim 51 has been further amended to limit the man-made polymer fibers to fibers selected from a group consisting of polyester, polypropylene, nylon, PBT, polyacrylonitrile and polybenzimidazole, basis found in the second paragraph of the Detailed Description of the specification. Claim 61 has been amended to correct an inadvertent omission of the word "long", basis found in claim 60. Claim 91 has been amended to limit the length of the glass fibers to about 0.7 to about 1.1 inch as in claim 51.

Applicants urge the Examiner to enter this amendment because it substantially reduces the many issues that the Examiner raised in the Final Action by further limiting the claims and places the application in better condition for allowance or appeal. Applicants believe that this amendment does not raise new issues because many of the previous claims limited the man-made polymer fibers to polyester fibers.

The claimed invention are nonwoven mats useful as the scored and folded vertical webs spanning between an exposed mat and a backer mat in a compressible ceiling tile as disclosed in published U. S. Patent Application No. 20020020142 filed April 23, 2001, including the ability to, after being scored, folded, and compressed, to spring back to the original shape and orientation, comprised of a blend of at least about 84 wt. percent and up to about 92 wt. percent of glass fibers having diameters in the range of about 13 to about 17.5 microns and lengths in the range of about 0.7 to about 1.25 inches, and about 8 to about 16 wt. percent of polymer fibers selected from a group consisting of polyester, polypropylene, nylon, PBT, polyacrylonitrile and polybenzimidazole, often polyester fibers, the blend of fibers bound together with about 25 +/- 5 wt. percent and of a particular type of binder. The claimed mats have excellent flame resistance and excellent and unexpected tensile strength, flex and recovery properties after scoring and folding, the mat passing the National Fire Protection Association's (NFPA) Method #701 Flammability Test

Flammability Test as well as critical tensile strength and a Taber Stiffness of at least about 50, properties essential for the mat to be used ceiling tile of the type described in U.S. Published Patent Application No. 20020020142. As pointed out in the Summary section of the specification, these properties are unique and unexpected in nonwoven mats containing a majority of glass fibers bound together with an organic binder. Also, as pointed out in the Jaffee Declaration, Jaffee being an expert in nonwoven mat technology, being the inventor or co-inventor of 11 US patents, see Exhibit A enclosed, and being aware of the contents of the references cited by the Examiner, made more than 100 different mats containing many different combinations of different fibers and different binders before a mat composition was tried that produced a mat that met the properties required for a mat to be used in the ceiling tile described above. Once that breakthrough was achieved, then ranges of variations, including those of the Examples set forth in the specification, were found that also met the requirements of the ceiling tile, and some combinations of variables produced mats having the better properties for this use than others although many could be used.

An example of a ceiling tile of the type described in U.S. Published Patent Application No. 20020020142, this ceiling tile sample having nonwoven mat dividers 52 spanning an outer sheet 54 and a backing mat 56, the mat dividers being scored and functioning to fold to allow the ceiling tile to be compressed or collapsed to save space for packaging and shipping. The presently claimed mats are suitable for the scored and folding dividers 52 in this type of ceiling tile. Also presented is a Declaration by the inventor, one having more than ordinary skill in the nonwoven mat art. As taught in U.S. Published Patent Application No. 20020020142, "The dividers [52], on the other hand, while preferably being made of fiberglass, could be made of a carbon fiber mat, some papers, cardboards, woven materials, films, or combinations thereof, with the important feature being that they have some predetermined modulus of resiliency, similar to the specific materials identified above, which allows them to be folded but remain resilient. If the materials are to be creased to define fold lines as discussed above in connection with fiberglass material, it is important that the material retain the modulus of resiliency after having been creased, which, of course, is true with fiberglass or carbon fiber materials." and "As mentioned, numerous materials might have applicability in the present invention, but in the preferred mode, the connector sheet and the dividers are made of the same material, which is a fiberglass mat made by Johns-Manville Corporation and the mat may be one designated No. 5802 or one designated No. 5803 by Johns-Manville." The 5802 is

The 5802 is a 120 g/m² mat composed of 10% PET/65% 16-micron glass/25% MF. The 5803 is a 100 g/m mat composed of 12% PET/68% 16-micron glass/20% MF. MF is an abbreviation for melamine formaldehyde resin, which exhibits the characteristics of a thermoset resin. PET is an abbreviation for a polyethylene terephthalate. Dividers made from either of the 5802 or 5803 material have the ability to expand with little or no addition of heat after having been creased and folded as described previously and after having been fully compressed. A more complete description of the Johns-Manville products and related products can be found in U.S. Pat. Nos. 5,840,413, 5,942,288, and 5,972,434, which are herein incorporated by reference. " The ceiling tile of U.S. Published Patent Application No. 20020020142 is a commercial product as shown by Exhibit 1 enclosed.

Claims 51-64, 71-84, 91-94 and 99 stand rejected under 35 USC 103 as being unpatentable over Geel in view of Arkens and as further evidenced by Chenoweth. The Examiner stated that Geel teaches nonwoven mats containing 10-80 wt. percent glass fibers and 20-90 percent PET fibers, having a diameter in the range of 6-16 microns and a length in the range of 0.15-0.98 inch, bound together with a resin binder, but not the type of binder used in the invention. The Examiner also stated that Geel teaches using binders that may be self-crosslinking, non-crosslinking or crosslinked with a suitable agent and teaches a binder content of about 20-50 percent, but doesn't teach using a binder that is at least partially curable or a binder consisting essentially of a homopolymer or a copolymer of polyacrylic acid and a polyol. The Examiner further states that Arkens et al teach a fiber glass nonwoven mat containing a type of binder of the type used in the invention and urges that it would have been obvious to have used the Arkens et al binder in the mats taught by Geel instead of the binder taught by Geel because both patents teach making nonwoven mats of fibers bound with a resin binder. The Examiner also admitted that none of the references teaches the Tabor stiffness, ratios of wet to dry tensile strength recited in the claimed invention or that the mats pass the NFPA Method #701 Flammability Test, but presumes, without any evidence whatever, and contrary to the evidence presented in the Jaffee Declaration, that this property would be inherent in the mats of Geel and Arkens et al. This rejection and its basis is respectfully traversed.

Geel discloses a nonwoven mat for use in vinyl flooring, a completely different application having completely different requirements than application the presently claimed mat is designed for. Geel makes no suggestion that his mat has the properties needed for

needed for use in ceiling panels of the type described in U.S. Published Patent Application No. 20020020142. Geel alleges broad ranges ratios of glass fibers to polymer fibers to binder content, but nowhere does he teach or reasonably suggest the weight percentage ranges of glass fibers, polymer fibers and binder in applicant's claimed mats. Note that Geel's examples both use a minority of glass fibers, a majority of polymer fibers and more than 40 wt. percent of binder comprised of polyvinyl alcohol and a secondary binder. Such mats are totally different in composition and properties than the presently claimed, nor does Geel reasonably suggest the mat compositions claimed. Geel teaches a mat having two binders, each applied at a different time and between two drying steps in the manufacturing process. Geel teaches first applying 10-20 wt. percent of polyvinyl alcohol and then later, after drying this mat, applies an additional 10-30 wt. percent of a second binder. Thus, the finished mat contains from about 20 to about 50 wt. percent of two different binders, not 10-30 percent as the Examiner urges. The Examiner has not given proper consideration this teaching of Geel. Geel certainly teaches the importance of the combination of two binders in his mats and that one of the binders is polyvinyl alcohol in an amount of 5-35 wt. percent of the fibers, see claim 1 of Geel. It would not have been obvious for one of ordinary skill to have concluded that polyvinyl alcohol was not an essential ingredient in the mats of Geel, yet the mats of applicants' claimed invention exclude any but possibly an inconsequential amount of polyvinyl alcohol as a trace amount or contaminant.. Because of this, Geel actually leads one away from the claimed invention, and prior art teachings that lead one away from the claimed invention is also evidence of non-obviousness.

The Examiner stated in the Final Rejection that it would have been obvious, in the sense of 35 USC 103, to have replaced both the primary binder and the secondary binder with the binder taught by Arkens et al. There is no reasonable teaching in Arkens et al or Geel that would suggest to one of ordinary skill in the art that one could replace both binders with a single binder and still obtain the objectives of Geel – doing so would have been patentable because that would have been unexpected, would have greatly simplified the process of Geel and substantially reduced capital cost and manufacturing expense of making the Geel mat. Geel would not have used two very different binders unless there was a very good reason to do so because as taught by Geel, doing so requires a separate step, two separate binder mix and supply systems and two separate binder application stations. Nothing in Geel remotely suggests that either of the two binders is unnecessary, and there is no teachings or reasonable suggestion in Arkens et al that the Arkens et al

al that the Arkens et al binder, having the characteristics claimed, could be used to replace both binders in the Geel mat and still achieve the objectives of Geel, or that doing so would produce a mat suitable for use in the compressible ceiling tile.

Further, Geel does not teach or reasonably suggest a nonwoven mat having a basis weight of about 2.3 to about 2.6 lbs/100 sq. ft. The basis weight is critical to achieving the necessary properties for being useful in the collapsible ceiling tile, especially the Taber stiffness of at least about 50 as shown by the trial results reported in paragraphs 4 (d) ii) and III) in the Jaffee Declaration where mats having basis weights of 1.08 lbs. per 100 sq. ft. fell far short of the claimed Taber stiffness. Also, Geel gives no guidance whatsoever for basis weight and for that reason is an invalid disclosure because it is not an enabling disclosure.

This invention is a chemical case and the effects of fiber sizes, fiber types, ratios of different fibers and amount and type of binder are not predictable, as the acts of an expert in this art, Jaffee, evidences in his Rule 1.132 affidavit where, because of such unpredictability, he tried more than 100 of such combinations over a period of more than 64 days before finding suitable combinations and properties for making the claimed mats. This is extremely strong evidence that the invention, nonwoven mats not requiring the costly glass microfibers previously required in one or more mats found suitable for the compressible ceiling tile, was not obvious to one of ordinary skill. Further evidence that Jaffee is an expert in the nonwoven mat art is the fact that he is an inventor or co-inventor of ten US patents as evidenced by Exhibit 2, also enclosed.

The Examiner states that "absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, "consisting essentially of" will be construed as equivalent to comprising." This appears to contrary to the long since established practice of interpreting the scope of the term "consisting essentially of". Unlike the case of PPG, applicants have very clearly set out the novel characteristics of the nonwoven mats of the invention are in the claims, and the term "consisting essentially of" in the claims defining the type of binder used was inserted to avoid an assertion that the claimed mat did not contain the polyvinyl alcohol binder present in the Geel mats.

Next, even if it had been obvious to use the binder of Arkens in the process of Geel for the secondary binder of Geel, one would not have arrived at the presently claimed mats

claimed mats because of the different ratios of glass fibers, fiber diameters, fiber lengths, polymer fibers and binder, and more importantly one would have ended up with mats containing at least 5 wt. percent, and according to the preferences of Geel, a much higher percentage of polyvinyl alcohol. The Examiner has not properly addressed this, and as shown by the evidence from an expert in the nonwoven mat technology, paragraphs #4d (i - iii), most, if not all of the mats taught by Geel would not have had the properties recited in the claimed invention and required for application in the ceiling tile mentioned specifically above. Note that the Jaffee Declaration evidences that the type of binder used and other parameters are critical to achieving a mat that has the properties recited in the claims and that it actually took more than 54 days and more than 100 trials of different mat compositions for an expert in this art, Alan Jaffee, to discover a suitable composition for meeting the requirements of the invention.

Failing to give weight to properties recited in article claims is reversible error, particularly when evidence to the contrary has been presented. It is improper to ignore property limitations in the claims when the composition of the item having the properties is different than reasonably taught by the reference and especially when the applicant is claiming the properties are critical to a particular different application and/or are unexpected. It is also improper to merely presume that all mats falling within very broad ranges of components, different components at that, have properties that are not remotely suggested by the reference or any reference cited. The presumptions, to be correct, must be reasonable and must be reasonably supported by evidence. Only when the compositions are exactly the same, or very nearly the same, would one be able to reasonably assume that the properties are the same, or very nearly the same. The Examiner has not met all of the structural or chemical properties of the nonwoven mats claimed, nor is there any evidence to support the allegation that any mat in the ranges taught by Geel will Inherently have the properties of the claimed mats. This argument applies to the flex properties following scoring and folding, the flammability test results, the Tabor Stiffness properties and the ratio of wet tensile to dry tensile strengths. Applicants have provided evidence in the Jaffee Declaration, paragraph #4 d (i, ii, iii), that the properties of the claimed mats, such as Tabor Stiffness, was not inherent in prior art mats, and the Examiner has not provided any evidence to support the allegation of inherency, see *In re Dembiczak*, 175 F. 3d 994, 50 USPQ 2d 1614 (Fed. Circuit 1999), for principle that the Examiner must have actual evidence from the prior art to support alleged suggestions to modify references, and *In re Soni*, 34 USPQ 2d 1634. (Fed. Circuit, 1995),

Circuit, 1995), In re Jones, 21 USPQ2d 1941 (Fed. Circuit, 1992) and In re Gordon, 221 USPQ 1127, 1783, for the principles that a showing of substantially improved results for the invention, and statements that the results were unexpected should suffice to establish unexpected results absent evidence to the contrary and that there must be a suggestion in the references of the desirability of combining the teachings of the references. Also see 182 USPQ 291, (CCPA, 1974) for principle that a prior art teaching of a broad range does not make obvious a narrower range if the narrow range produces much better results or properties than taught by the reference for the broad range. Once the applicants have provided evidence showing that the inherency alleged by the Examiner is wrong, the burden then shifts to the Examiner to show that inherency does in fact exist. The Jaffee Declaration shows that combinations taught by Geel fall far short of a Taber stiffness of 50.

Additionally, the application that the mats of the invention were designed for are for ceiling tiles of the type disclosed in US. Pat. App. No. 2002020142 as pointed out in the specification. In that patent application, the mats that were said to perform as the dividers, i.e. the mats that have to be scored and folded and then have the properties that will cause the ceiling tile to spring back into the proper thickness after having been compressed for storing and shipping and storing awaiting use, were mats disclosed in three patents owned by the assignee of the present invention, particularly US 5,840,413 and 5,942,288. The mats taught in those patents contained expensive glass microfibers, i.e. having diameters below 5 microns, and bound with a melamine formaldehyde binder. Glass microfibers cost at least double per pound compared to the 13 – 17.5 micron fibers used in the claimed mats. The mats of the present invention do not require the presence of fine glass fibers to meet the requirements for the dividers in the ceiling tile and that is a further unexpected result of the combinations claimed. The Examiner urges that since the claimed invention are mats and not ceiling tiles, that the properties required in the mats to be used in the ceiling tiles is irrelevant. The present claims now clearly state that the claimed mats are useful as the scored and folded vertical webs spanning between an exposed mat and a backer mat in a compressible ceiling tile as disclosed in published U. S. Patent Application No. 20020020142 filed April 23, 2001, including the ability to, after being scored, folded, and compressed, to spring back to the original shape and orientation and thus have the characteristics required for that application, something that none of Geel, Arkens et al or Chenoweth disclose or reasonably suggest to one of ordinary skill in the art. Applicants have shown how difficult it was to invent mats having the properties necessary for this new

the properties necessary for this new type of ceiling tile and those properties were not known in prior art mats. This new type of ceiling tile could not be as cost competitive and be as commercially desirable until the mats of the claimed invention were invented. Applicants have presented evidence to support the importance of these mat properties and the Examiner has provided no evidentiary basis for urging that these properties are inherent in the mats of Geel. The claimed mats advance the art of nonwoven mats in an unobvious way and as such meet the requirements of 35 USC 103.

Chenoweth is apparently relied on for teaching a range of polymer fibers in combination with rotary spun, not chopped fibers, glass fibers. Chenoweth teaches compressible blankets, col. 2, lines 45-50 and col. 3, lines 61-64, of finer glass fibers (3-10 microns in diameter) and completely different types of products than the presently claimed mats, see the Jaffee Declaration, paragraph #4d (i-iii). Chenoweth also teaches away from the claimed mats, teaching that an optimum proportion of glass fibers is 62 percent and an optimum proportion of polymer fibers is 21 percent and the optimum percent of binder is 16.5 percent. Also, the type of glass fibers taught are completely different types of fibers as described above, have fiber diameters much lower than the mats of the claimed invention, and that have various indeterminate lengths of less than 1/2 inch to approx. 3 inches. The chopped fibers in applicants' claimed mats have a narrow length distribution because of having been chopped in definite lengths from strands containing hundreds or thousands of continuous fibers whereas the rotary spun fibers of Chenoweth were shredded, see col. 3, line 68. The polymer fibers of Chenoweth also have lengths and deniers broader in range than the fibers of the claimed invention, see col. 4, lines 12-25. Chenoweth cannot reasonably suggest the compositions of the current claims, because he is dealing with different types of fibers and different types of products aimed at different applications, automotive hood liners and similar products, see col. 5, lines 25-32. By looking at any automobile hood liner one can readily see that the products are completely different than the claimed mats and the mat of Exhibit 1. Chenoweth does not teach or reasonably suggest that his product would be suitable for use in a ceiling tile of the type described earlier, nor would one skilled in the art so conclude. The Examiner urges that applicants' ranges for the concentration of polyester fibers are broad and encompass typical values found in the prior art as evidenced by Chenoweth. With due respect, this allegation is wrong! The claimed mat contains about 8-12 wt. percent of man-made polymer fibers and this range is not broad. Chenoweth urges in Table 1 that a

is not broad. Chenoweth urges in Table 1 that a range of 30-50 wt. percent of synthetic fibers are functional, that a range of 10-30 wt. percent are preferred, and that 21 wt. percent is optimal, and this is in combination, not with 13-17.5 micron fibers about 0.7 to about 1.1 inch long like in the claimed mats, but instead with rotary spun glass fibers having diameters of 3-10 microns (col. 2, lines 21-22) and lengths of less than 1/2 inch to approx. 3 inches (col. 3, lines 67-68).

Finally, because of the many differences in the mat constructions, suggested applications and properties of the mats or blankets taught by Geel, Arkens et al and Chenoweth from the claimed invention, the present rejection seems to be a improper hindsight reconstruction using applicants' own disclosure as a template to assemble irrelevant pieces of prior art to try to establish a case for obviousness, see American Medical Systems, Inc. v Medical Engineering Corp., 26 USPQ 2d, 1081, 1091, (District Court of E.D. Wisconsin, 1992) for the principal that one may not use the applicants' disclosure as a "road map" for finding and combining prior art using only hindsight after having the benefit of applicants disclosure. Several discrepancies or deficiencies in the prior art teachings relative, such as the fact that polyvinyl alcohol is an essential ingredient in the mats of Geel, the different suggested applications suggested, the teaching away by preferred or optimal combinations taught with the difference in the glass fibers taught by Chenoweth and Arkens et al are evidence that the present rejections are improper hindsight rejections.

For the above reasons applicant believes that the present claims are patentable under 35 USC 103 and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Claims 51-64, 71-84, 91-94 and 99 were provisionally rejected under the non-statutory double patenting doctrine because of the claims in pending patent application Serial No. 10/717,802 in view of Geel. The Examiner states that the claims of the copending application fail to include polymer fibers in the nonwoven mat, but that because of the teachings of Geel it would have been obvious to have included polymer fibers in the invention of the other pending application. This rejection is respectfully traversed. First, because the Jaffee Declaration shows that mats without the polymer fibers will not meet the requirements of the folding mats in the ceiling tile in Pub. App. 20020020142 and therefore are not merely an obvious modification – unexpected results flow from the

flow from the claimed additions of polymer fibers and these results are not reasonably taught or suggested by Geel or by applicants's copending application. Second, the mats in the patent application Serial No. 10/717,802 will not meet the requirements for the vertical, folding panels in the ceiling tile of Pub. App. 20020020142, but instead are for the exposed or backer facing mat joined to the vertical, folding panels. Finally, the present claims cannot prevent the practice of the invention in Serial No. 10/717,802 - that invention does not require the use of polymer fibers in the mat as the present claims require. Also, for the same reasons given above, it would not have been obvious to one of ordinary skill in the art to have modified the invention in 10/17,802 in such a way as to arrive at the present invention. The mats of 10/17,802 were designed for the facing and backer mats of the type of ceiling tile disclosed in Pub. App. 20020020142 and do not have the properties after scoring and folding necessary for the divider mat that the mats of the present invention satisfy. For these reasons the Examiner is respectfully requested to withdraw this rejection and to allow all of the claims.

Applicants believe that the claims are now in condition for allowance, but if the Examiner believes one or more issues still exist, to expedite disposal of this application the Examiner is respectfully invited to call Applicants' attorney at the number listed below to discuss the issue or issues and a way of removing.

Respectfully submitted,


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